



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/563,519

06/20/2006

Ofer Sneh

020008.0112PTUS

8637

24283 7590 06/05/2008  
PATTON BOGGS LLP  
1801 CALIFORNIA STREET  
SUITE 4900  
DENVER, CO 80202

EXAMINER

CHEN, KEATH T

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

06/05/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,519	<b>Applicant(s)</b> SNEH, OFER	
	<b>Examiner</b> Keath T. Chen	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The claim amendment filed on 02/26/2008, addressing claims 1-11 rejection from the first office action (11/28/2007), by amending claims 1-8 and adding new claim 16, is acknowledged and will be addressed below.

### ***Election/Restrictions***

2. Applicant's confirmation of election of Group I, claims 1-11 in the reply filed on 02/26/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

**3. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhatnagar et al. (US 6391146, hereafter '146).**

4. '146 teaches the limitations of:

5. Claim 16: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), comprising: (a) a first flow restricting element (FRE) (throttle valve #82, Fig. 1); (b) a pressure control chamber (PCC) (#210, gas energized reactor) located in serial fluidic communication downstream from said first FRE; (d) a gas source (one of the #235, col. 7, lines 37-40); (e) a flow controlling device (one of the control

Art Unit: 1792

valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC; (f) a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; and (g) an abatement element (#226a-b, electrode) located within said PCC.

6. '146 does not teach the limitation of:

7. Claim 16: (c) a second FRE located in serial fluidic communication downstream from said PCC.

8. '146 further teaches a throttle valve at the inlet #211 to prevent backflow (col. 6, lines 35-38). At the time the invention was made, it would have been obvious to a person of ordinary of skill in the art to have added an additional throttle valve between the outlet (#212, Fig. 4) and pumps (#125) to further prevent backflow of effluent (#100). This additional throttle valve would have been a second FRE downstream from said PCC (#210).

9. Motivation would have been to further prevent backflow of effluent, as taught by '146 (col. 6, lines 35-38).

10. '146 discloses the claimed invention except for an additional throttle valve. It would have been an obvious matter of design choice to duplicate the throttle valve, since it has been held that mere duplication of the essential working parts of a device

involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

**11. Claims 1, 3-5, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhatnagar et al. (US 6391146, hereafter '146), in view of Halsey et al. (US 6663025, hereafter '025).**

12. '146 teaches the limitations of:

13. Claim 1: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), characterized by: a first flow restricting element (FRE) (throttle valve #82, Fig. 1); a pressure control chamber (PCC) (exhaust tube #85, similar to exhaust tube shown in various figures in instant application) located in serial fluidic communication downstream from said first FRE; a second FRE (throttle valve, not shown in Fig. 4, close to inlet #211, col. 6, lines 35-38) located in serial fluidic communication downstream from said PCC; a gas source (one of the #235, col. 7, lines 37-40); and a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC.

14. Claim 5 (besides the limitations of claim 1): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), said apparatus characterized by; a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication upstream from said process chamber; an upstream flow control device (the valve as shown in Fig. 1, not

Art Unit: 1792

labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

15. Claims 4 and 8: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) wherein a process chamber (Fig. 1, #25) is located in serial fluidic communication upstream from said first FRE (#82); said process chamber and said PCC (#85) are formed as compartments within a single process vessel (#200, #85, and wall of chamber #25 are connected into a single vessel); and said first FRE (#82) is formed within the partition between said process chamber (#25) and said PCC (#85).

16. Claim 9: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is LPCVD (col. 12, line 35, col. 3, line 39, low pressure).

17. Claim 10: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is RIE (col. 4, line 4 and col. 3, line 40, plasma etching is RIE).

18. Claim 11: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is PECVD (col. 3, line 40).

19. For claims 9-11, applicant's claim requirements "LPCVD", "RIE", and "PECVD" are considered intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235

(CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

20. '146 does not teaches the limitations of:

21. Claims 1 and 5: said first FRE is an immobile flow restricting element.

22. '025 is an analogous art in the field of manufacturing of semiconductor devices using plasma (field of the invention; similar to '146, col. 1, lines 53-56 and col. 3, line 13), particularly in rapid cycling of venting and pumping gas (col. 2, lines 39-41; similar to '146 effluent gas treatment, abstract). '025 teaches an immobile diffuser/flow restrictor (#200, Fig. 4A or 4B) at the bottom of the chamber (see Fig. 3A).

23. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have added an immobile diffuser/flow restrictor, as taught by '025, to the bottom of chamber in Fig. 1 or 146, or upstream of Fig. 4 of '146. This diffuser/flow restrictor would have been the first FRE.

24. The motivation to add an immobile diffuser/flow restrictor is to provide a rapid cycle in venting and pumping gas, as taught by '025 (col. 2, lines 39-41), and to reduce minute particle contamination (col. 3, lines 26-28).

25. '146 further teaches the limitations of:

26. Claims 3 and 7: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) further characterized by: an abatement chamber (#210, gas energized

Art Unit: 1792

reactor); a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said abatement chamber; and an abatement element (#226a-b, electrode) located within said abatement chamber.

27. '146 does not teach the limitations of:

28. Claim 3: A third FRE connected in serial fluidic communication downstream from said PCC (#85); an abatement chamber connected in serial fluidic communication upstream from said third FRE

29. Claim 7: A third FRE connected in serial fluidic communication downstream from said PCC (#85); an abatement chamber connected in serial fluidic communication upstream from said third FRE

30. '146 further teaches a throttle valve at the inlet #211 to prevent backflow (col. 6, lines 35-38). At the time the invention was made, it would have been obvious to a person of ordinary of skill in the art to have added an additional throttle valve between the outlet (#212, Fig. 4) and pumps (#125) to further prevent backflow of effluent (#100). This additional throttle valve would have been a third FRE downstream from said PCC(#85) and the abatement chamber (#210) upstream from said third FRE.

31. Motivation would have been to further prevent backflow of effluent, as taught by '146 (col. 6, lines 35-38).

Art Unit: 1792

32. '146 discloses the claimed invention except for an additional throttle valve. It would have been an obvious matter of design choice to duplicate the throttle valve, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

**33. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '146, in view of '025.**

34. '146 teaches the limitations of:

35. Claim 1: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), characterized by: a first flow restricting element (FRE) (throttle valve #82, Fig. 1); a pressure control chamber (PCC) (#210, gas energized reactor) located in serial fluidic communication downstream from said first FRE; a gas source (one of the #235, col. 7, lines 37-40); and a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC.

36. Claim 5 (besides the limitations of claim 1 right above): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), said apparatus characterized by; a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication upstream from said process chamber; an upstream flow control device (the valve as shown in Fig.

Art Unit: 1792

1, not labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

37. Claims 2 and 6: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) further characterized by: a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; and an abatement element (#226a-b, electrode) located within said PCC.

38. '146 does not teaches the limitation:

39. Claims 1 and 5: said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC.

40. '025 is an analogous art in the field of manufacturing of semiconductor devices using plasma (field of the invention; similar to '146, col. 1, lines 53-56 and col. 3, line 13), particularly in rapid cycling of venting and pumping gas (col. 2, lines 39-41; similar to '146 effluent gas treatment, abstract). '025 teaches an immobile diffuser/flow restrictor (#200, Fig. 4A or 4B) at the bottom of the chamber (see Fig. 3A).

41. '146 further teaches a throttle valve at the inlet #211 to prevent backflow (col. 6, lines 35-38). At the time the invention was made, it would have been obvious to a person of ordinary of skill in the art to have added an immobile diffuser/flow restrictor, as taught by '025, to the bottom of chamber in Fig. 1 or 146, or upstream of Fig. 4 of '146. This diffuser/flow restrictor would have been the first FRE; and to have added an

Art Unit: 1792

additional throttle valve between the outlet (#212, Fig. 4) and pumps (#125) to further prevent backflow of effluent (#100). This additional throttle valve would have been a second FRE downstream from said PCC (#210).

42. The motivation to add an immobile diffuser/flow restrictor is to provide a rapid cycle in venting and pumping gas, as taught by '025 (col. 2, lines 39-41), and to reduce minute particle contamination (col. 3, lines 26-28). The motivation to add an additional throttle valve would have been to further prevent backflow, as taught by '146 (col. 6, lines 35-38).

43. '146 discloses the claimed invention except for an additional throttle valve. It would have been an obvious matter of design choice to duplicate the throttle valve, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

### ***Response to Arguments***

44. Applicant's arguments filed on 02/26/2008 have been fully considered but they are not persuasive.

45. Applicant's amendment of claim 3, see the bottom of page 6 to the first complete paragraph of page 7, overcomes drawing objection and 35 USC first paragraph rejection.

46. In regarding to 35 USC 102(b) rejection of claims 1, 4, 5, and 8-11 based on Bhatnagar et al. ('146), see the 2<sup>nd</sup> complete paragraph of page 7 to the first complete

paragraph of page 8, applicant's argument is unconvincing in light of new grounds of rejections.

47. In regarding to 35 USC 103(a) rejection of claims 3 and 7; and to claims 1, 2, 5, and 6; see the 2<sup>nd</sup> complete paragraph of page 8 to the top of page 9, applicant's argument is that "backflow in a location so close to a pump as depicted in Figs. 3 and 4 of the '146 patent is very unlikely.

48. This argument is found not persuasive. "Argument does not replace evidence where evidence is necessary", see MPEP 2145 I. The examiner maintains that an addition valve prevent the backflow of effluent, as described in '174, col. 6, lines 36-38.

49. The examiner notices that applicant fail to address the obviousness of duplicating of parts (throttle valve) by case law.

### ***Conclusion***

50. Applicant's amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1792

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keath T. Chen whose telephone number is 571-270-1870. The examiner can normally be reached on M-F, 8:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T. C./  
Examiner, Art Unit 1792  
/Rudy Zervigon/  
Primary Examiner, Art Unit 1792